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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,303	12/31/2003	Hiroaki Nishimura	50090-563	8420

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EXAMINER

TRINH, MICHAEL MANH

ART UNIT PAPER NUMBER

2822

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/748,303

Applicant(s)

NISHIMURA ET AL.

Examiner

Michael Trinh

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/191,120.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12-31-2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

*** This office action is in response to filing of the application on December 31, 2003.

Claims 1-14 were canceled. Claims 15-17 are pending.

Specification

1. In the specification, under related Applications, the application Serial No. "07/722,479" is incorrect and should be --09/722,479--. Moreover, updating the information to include U.S. Patent No. 6,673,671 is respectfully requested.
2. Claims 16-17 are objected to because of the following informalities: claims 15-17 recite "fourth" and "fifth", but there is no first, second, and third. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 15-16 are rejected under 35 U.S.C. 102(e),(a) as being anticipated by Sakoh (5,824,591).

Sakoh teaches a method for forming a semiconductor device including a storage node and a dielectric film (28 in Figs 2g; 30 in Fig 2h) for tilt prevention purposes, wherein the storage node has a vertical surface extends in the direction perpendicular to the surface of a semiconductor substrate and a horizontal surface extending along the surface of the semiconductor substrate, and wherein the dielectric film is brought into close contact with the side surface of the vertical surface and prevents the vertical surface from tilting, the method

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comprising the steps of: forming the horizontal surface 23 (Figs 2b-2c; col 4, lines 25-60) on the surface of the semiconductor substrate; forming a fourth dielectric layer 24 having a given thickness from a fourth dielectric material on the horizontal surface (Figs 2b-2c); forming the vertical surface 27 while being brought into close contact with the horizontal surface 23 and the outer circumferential surface of the fourth dielectric layer 24 (Fig 2d; col 4, lines 50-60); forming a fifth dielectric layer 30,28 around the vertical surface from a fifth dielectric material differing from the fourth dielectric material 24 (Figs 2h,2e-2g; col 5, lines 21-31; col 4, line 62 through col 5, line 40); and eliminating the fourth dielectric layer 24 by means of etching through use of a measure suitable for eliminating the fourth dielectric material and for conserving the fifth dielectric material (col 5, lines 11-20; Figs 2g,2h). Re claim 16, wherein etching the fifth dielectric layer 28,30 until the thickness thereof is equal to a given length so that the tip end of the vertical surface is out from the surface of the fifth dielectric layer 30,28 by only a given length (Figs 2f, 2g,2h; col 4, line 62 through col 5, line 31).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakoh (5,824,591) taken with Fazan (5,392,189) and Kim (6,087,226).

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Sakoh teaches a method for forming a semiconductor device including a storage node and a dielectric film (28 in Figs 2g; 30 in Fig 2h) for tilt prevention purposes, as applied to claims 15-16 above, wherein the dielectric film is an oxide film.

Sakoh lacks having an nitride film for the fourth dielectric film.

However, Fazan teaches (at col 6, line 63 through col 7, line 5) forming a dielectric film 83 for a tilt preventing purposes, wherein the dielectric film comprises oxide and nitride. Kim teaches (at col 4, lines 14-20; Fig 1) forming a fourth dielectric film 16 on the horizontal surface of the storage node 14, wherein the fourth dielectric film 16 includes nitride or oxide.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the dielectric film of Sakoh by employing oxide or nitride for one of the dielectric films with the fourth dielectric film of nitride and the fifth dielectric film of oxide as taught by Fazan, Kim, and Sakoh. This is because of the desirability to improve the etching rate between the fourth dielectric layer and the fifth dielectric layer so that etching to eliminate of the fifth dielectric layer can be performed in an selective manner with respect to the fourth dielectric layer, wherein etching of the nitride layer is highly selective to etching of the oxide layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (571) 272-1847. The examiner can normally be reached on M-F: 8:30 Am to 5:00 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0956.

Oacs-16



Michael Trinh
Primary Examiner